



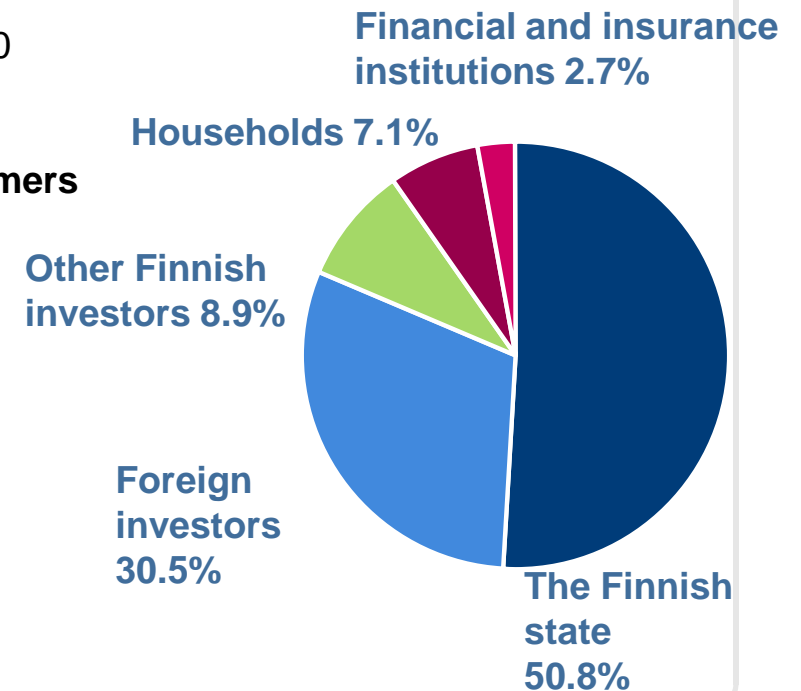
Advantages of Biofuel CHPs

**Zemgale Energy Days
Jelgava**





Ginta Cimdiņa-Pundure
24 September 2010

Fortum is the world's 4th largest heat producer with operations in 8 countries

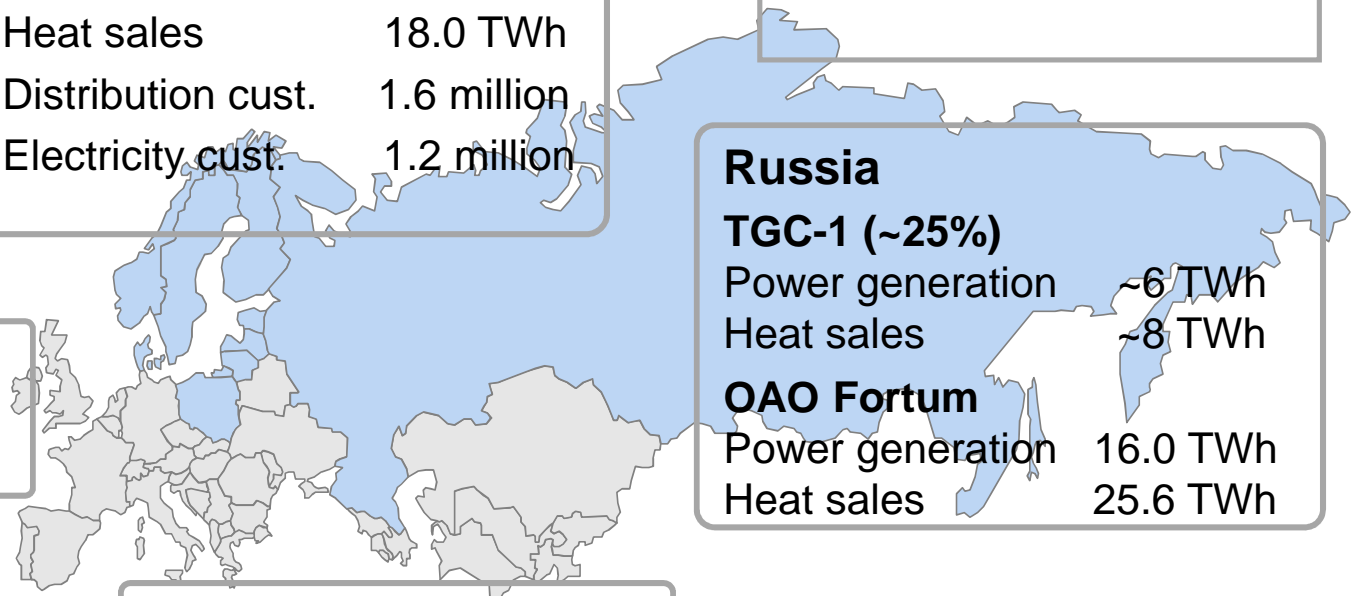
- Listed at the Helsinki Stock Exchange since 1998
- Over 90,000 shareholders
- **Heat sales 50,2 TWh and electricity sales 20,4 TWh (2009):**
 - CHP/condensing production in over 30 plants
 - Small scale heat production in over 700 heat-only boilers
 - Operations in over 200 district heating networks located in 80 cities
- **Industrial heat and steam supply for over 250 industrial customers**
- **Management model under two divisions**
 - Heat:** Sweden, Finland, Norway, Poland and Baltic countries
 - Russia:** OAO Fortum (former TGC-10) and ~25% in TGC-1



Our geographical presence today

Nr 1		Heat	Nordic countries Generation 48.1 TWh Electricity sales 54.9 TWh Heat sales 18.0 TWh Distribution cust. 1.6 million Electricity cust. 1.2 million
Nr 1		Distribution	
Nr 2		Electricity sales	
Nr 3		Power generation	

Poland	
Heat sales	3.7 TWh
Electricity sales	20 GWh



Baltic countries	
Heat sales	1.3 TWh
Electricity sales	0.1 TWh
Distribution cust.	24,100

Total sales:

- ca. 25 TWh heat
- 5 TWh electricity

Total production capacity:

- 23 CHP plants
- 700 heating plants and stations

Russia

TGC-1 (~25%)

Power generation	~6 TWh
Heat sales	~8 TWh

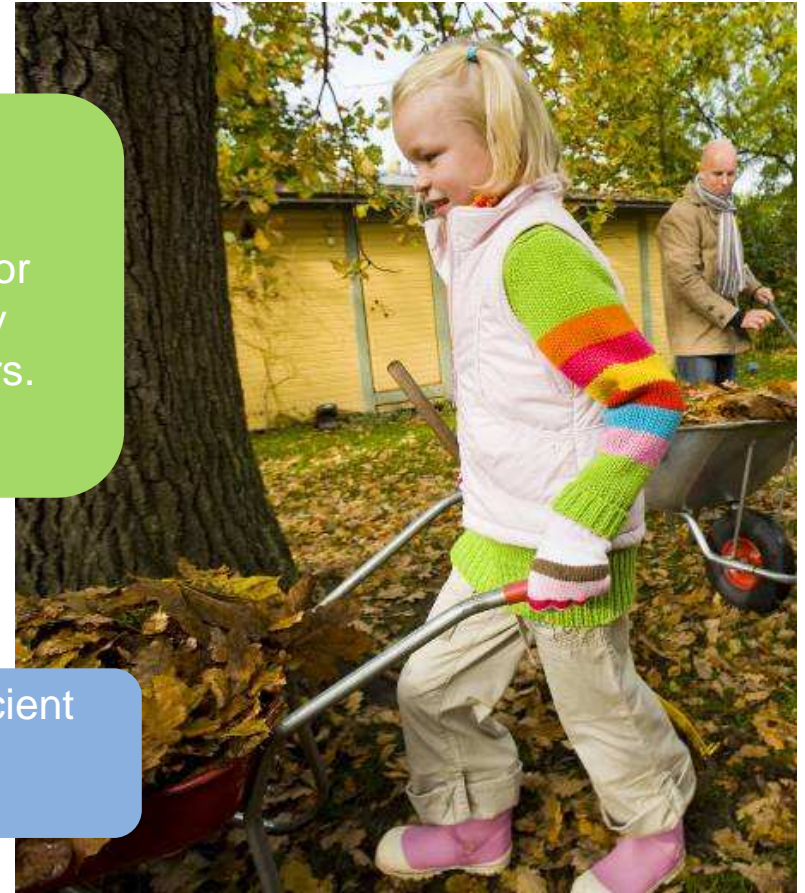
OA O Fortum

Power generation	16.0 TWh
Heat sales	25.6 TWh

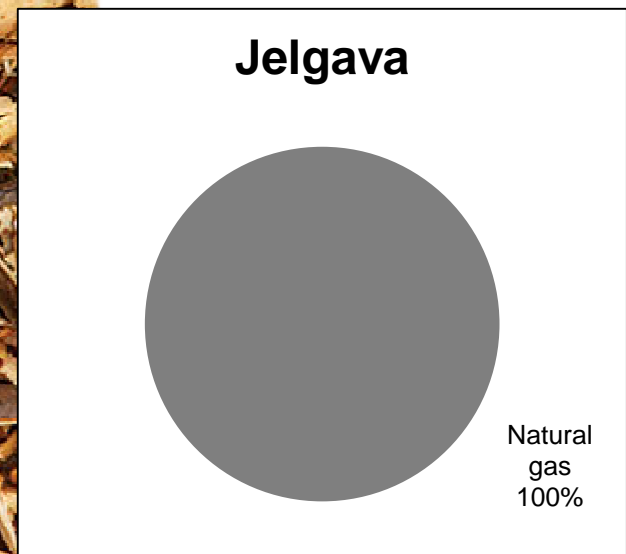
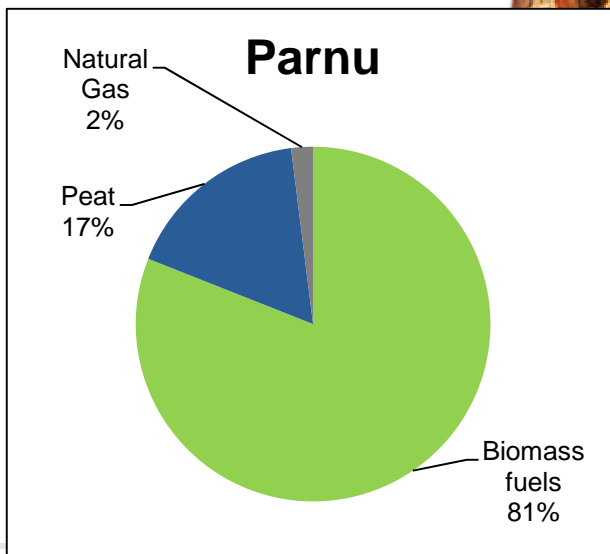
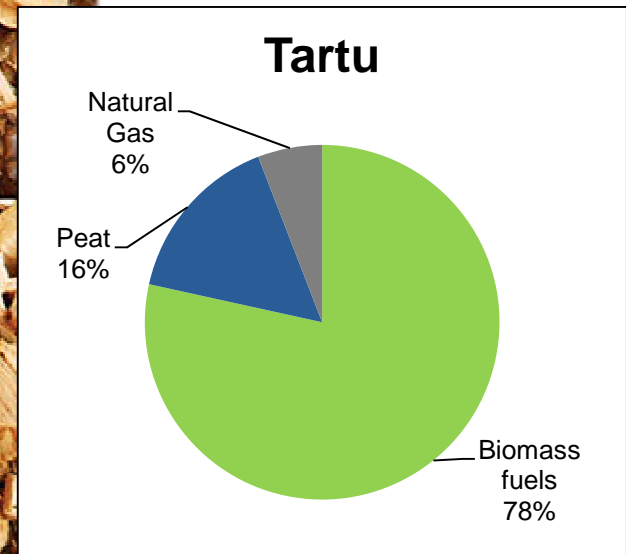
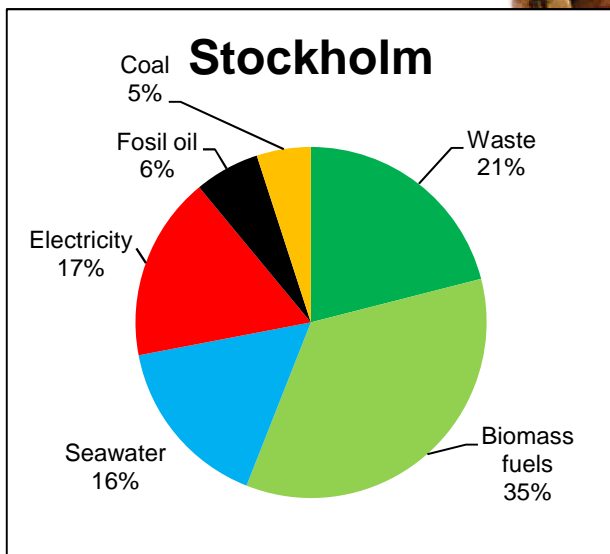
Fortum's Mission and Strategy

Fortum's purpose is to create energy that improves life for present and future generations. We provide sustainable solutions that fulfill the needs for low emissions, resource efficiency and energy supply security, and deliver excellent value to our shareholders.

Competence in CO₂ free nuclear, hydro and energy efficient CHP production, and operating in competitive energy markets



Fuel mix



Overview of Heat's main CHP plants

Existing Main CHP's in Heat Division	Fuels	Electricity MW	Heat MW
CHP Suomenoja, Finland	Gas, Coal	370	565
CHP Naantali, Finland	Coal, biomass	325	430
CHP Stockholm City, Sweden	Coal	125	295
CHP Högdalen, Stockholm, Sweden	Waste, biofuel	70	150
CHP Brista, Stockholm, Sweden	Biofuel	42	108
CHP Hässelby, Stockholm, Sweden	Wood pellets	75	194
CHP Joensuu, Finland	Biofuels, Peat	70	130
CHP Nokia, Finland	Gas	70	85
CHP Tartu, Estonia	Biofuels, Peat	22	65

CHP Projects, under construction or planned	Fuels	Electricity MW	Heat MW
CHP Czystochowa	Coal, biomass	65	120
CHP Pärnu, Estonia	Biomass, peat	20	45
CHP Klaipeda, Lithuania	Waste, biomass	20	50
CHP Brista, Sweden	Waste	20	60
CHP Järvenpää, Finland	Biomass, peat	24	60
CHP Jelgava, Latvia	Biomass	23	45

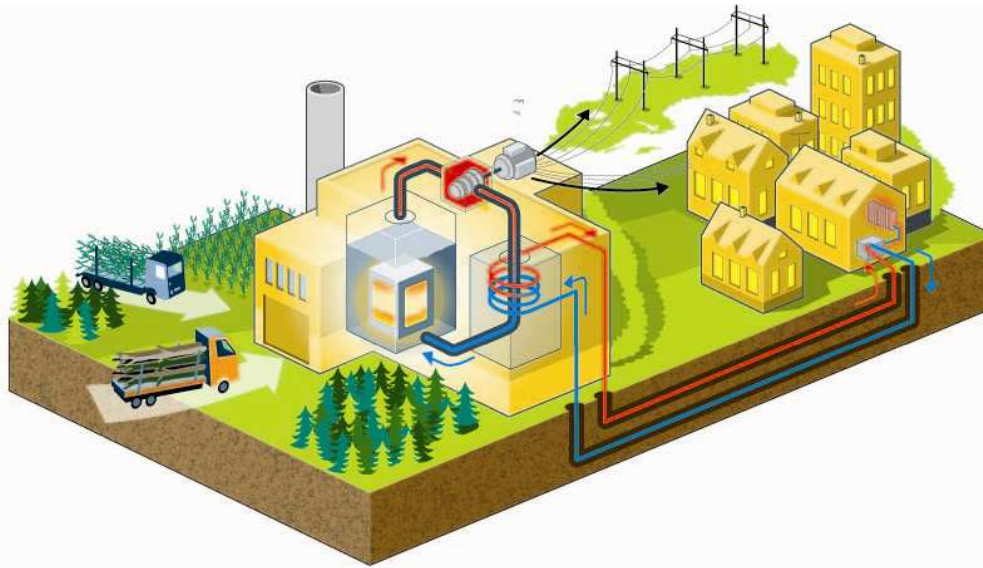


Naantali CHP plant provides heat for the city of Turku

CHP regulation challenges in Latvia

Date	No	Title	Status
24.07.2007.	503	“Regulations Regarding power production using RES ”	not in force
24.02.2009.	198	“Regulations Regarding power production using RES and determination of price”	not in force
16.03.2010.	262	“Regulations Regarding power production using RES and determination of price”	in force
06.11.2006.	921	“Regulations regarding power production in cogeneration ”	not in force
10.03.2009.	221	“Regulations regarding power production and price determination for power produced in cogeneration ”	changed 18.03.2009, 01.12.2009, 31.12.2009, 23.09.2010
End 2010		“Renewable energy Law “	in prog. from Jan-2010

Combined heat and power production and district heating is extremely energy efficient



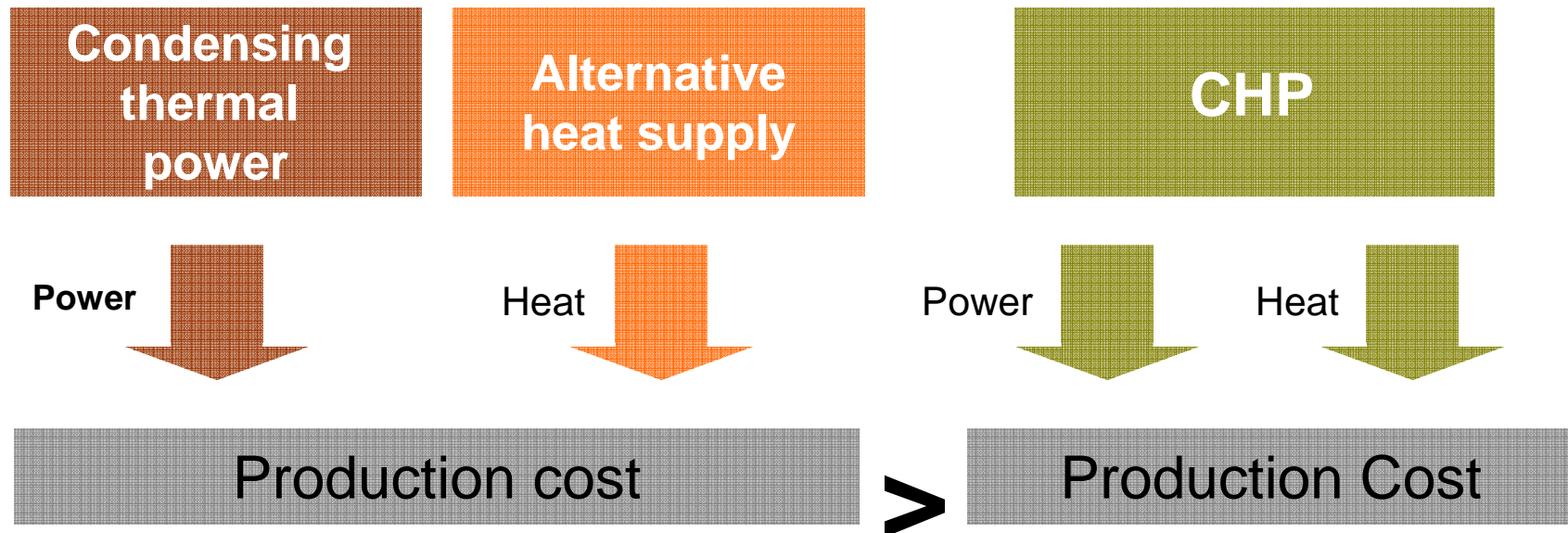
- Fuel efficient CHP utilising heat as primary energy source
- CHP is small scale electricity production
- Very high fuel efficiency
- Small scale production enables local fuels (bio, waste, peat) with lower price volatility
- Competitiveness of CHP increases with higher coal and gas prices, and with the need to reduce emissions (CO₂)
- Dust emission regulation (Industrial Emissions Directive) by 2016 drives potential for new CHP investments

Benefits of CHP are undisputable – offering untapped business opportunities

- High fuel efficiency
- High fuel flexibility
- A key solution in meeting increasing demand for heat and power in urban environments
- Politically sound solution for sustainability
- Subsidies from power production (Green certificates)
- Competitive
- Still unexploited potential



Value creation logic based on the cost of alternative supply options



If electricity price is set by condensing thermal power plant new entry cost and heat is priced according to alternative supply, CHP production is principally profitable due to more efficient fuel utilisation.

Emission reduction targets and increasing fuel costs will promote growth of CHP production in the future

Customer and Social Benefits from District Heating



Customer benefits

- Competitive price
- Comfortable and reliable
- Constant local presence
- Automated metering and online reporting support energy savings

Social benefits

- Enables efficient CHP production and thus superior CO₂ efficiency
- Suits urban infrastructure
- Centralized emission control in power plant

Other benefits

- Fuel flexibility
- New market and new industry development (based on local biofuels)
- New work places

Parnu CHP plant (2010-Apr)



- Heat 45 MW
- Electricity 24 MW
- Fuel:
 - peat 50%,
 - biomass 50%,

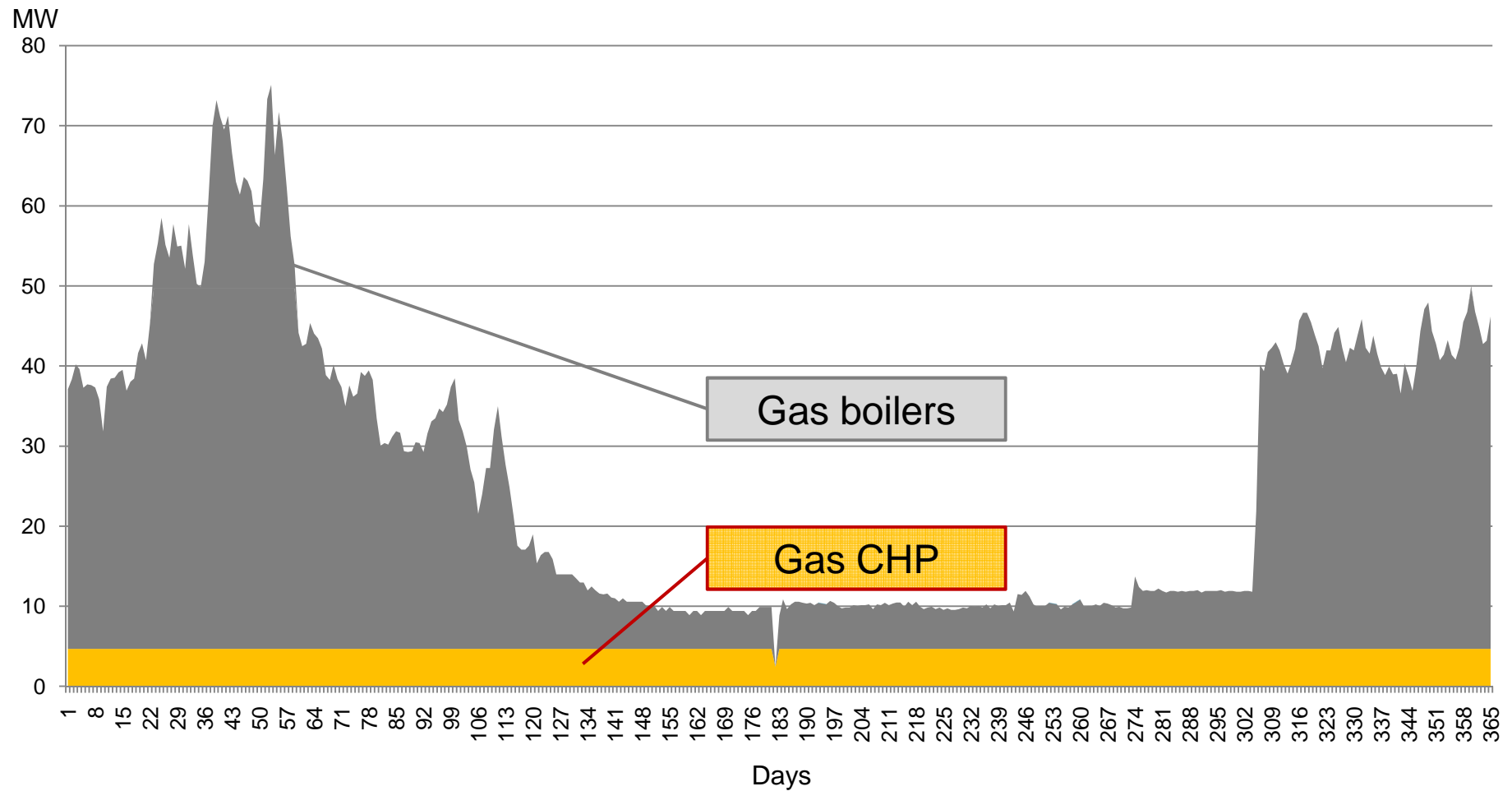


Tartu CHP plant

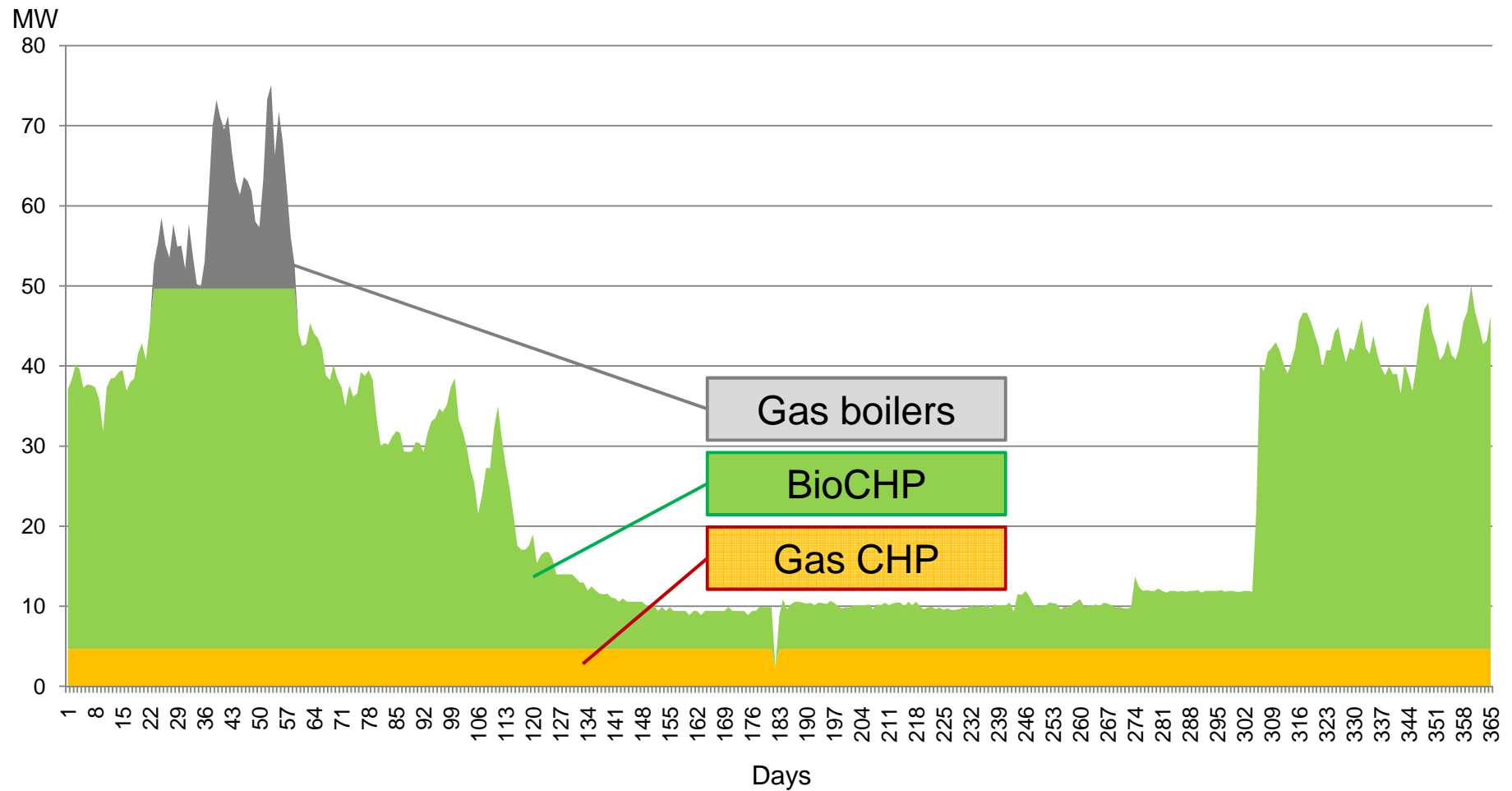


- Heat 52 MW
- Electricity 25 MW
- Fuel:
 - peat 40%,
 - biomass 50%,
 - waste 10%

Existing heat load curve

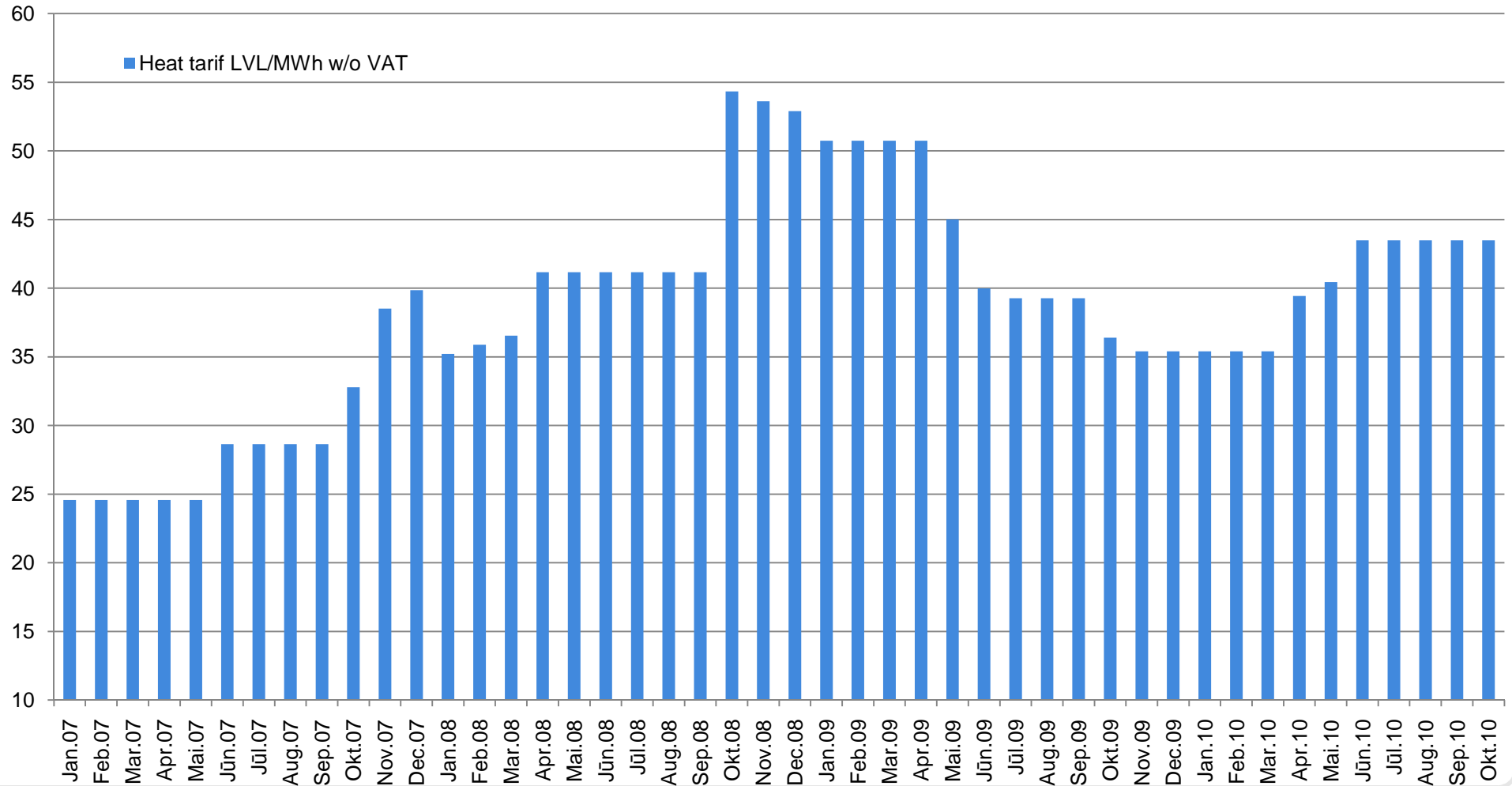


Heat load curve with BioCHP

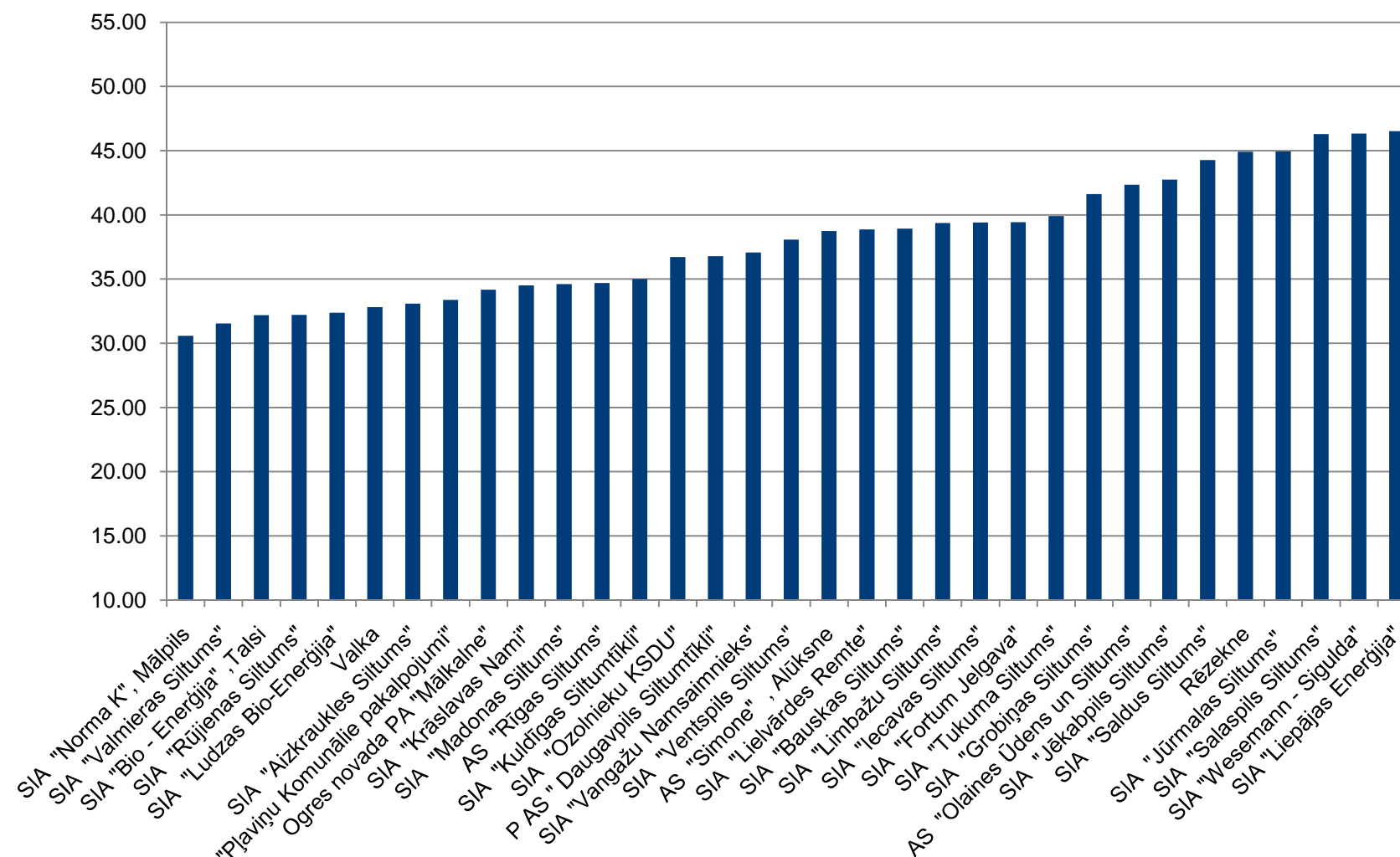


Heat Tariff from 2007 - 2010

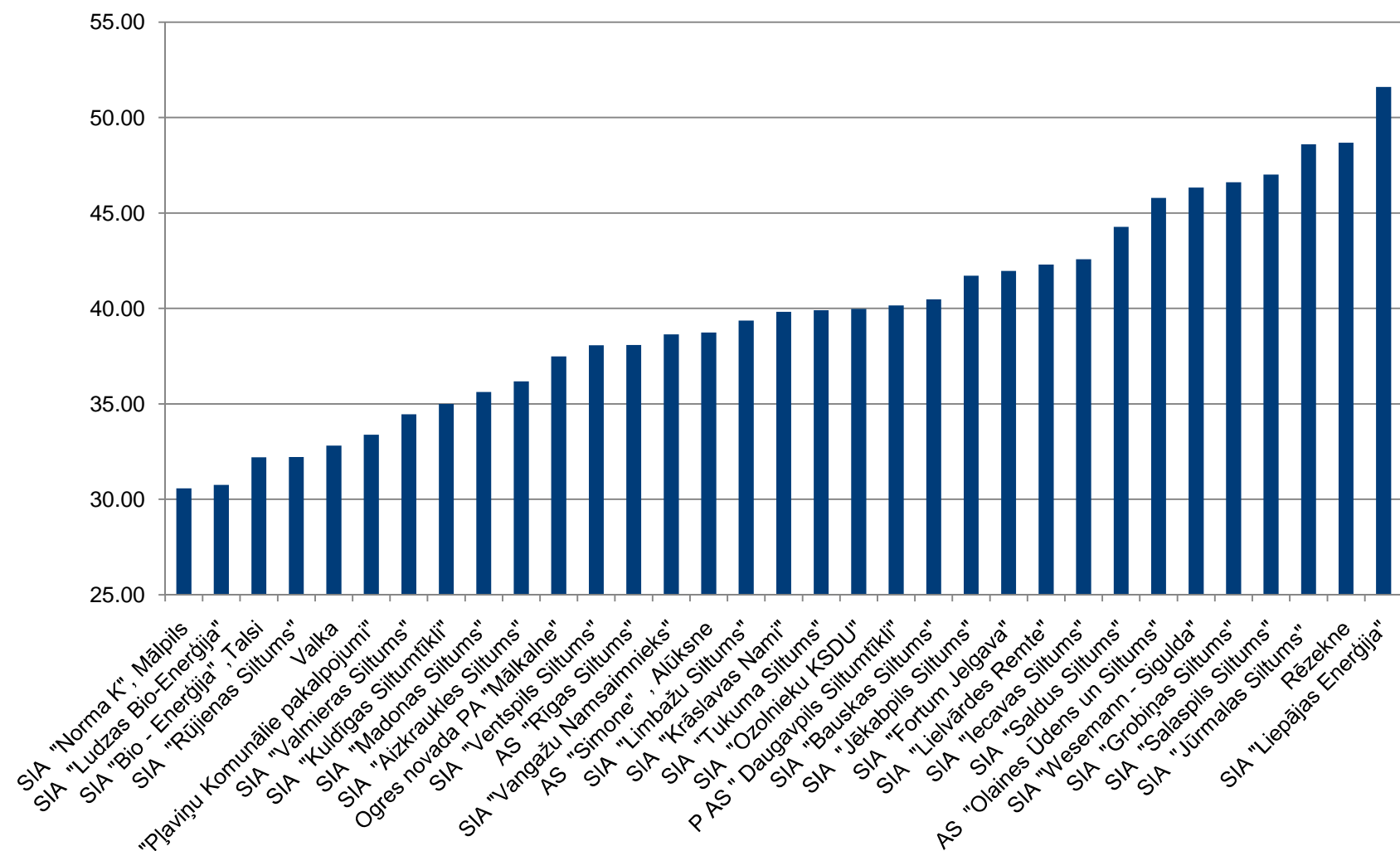
LVL/MWh



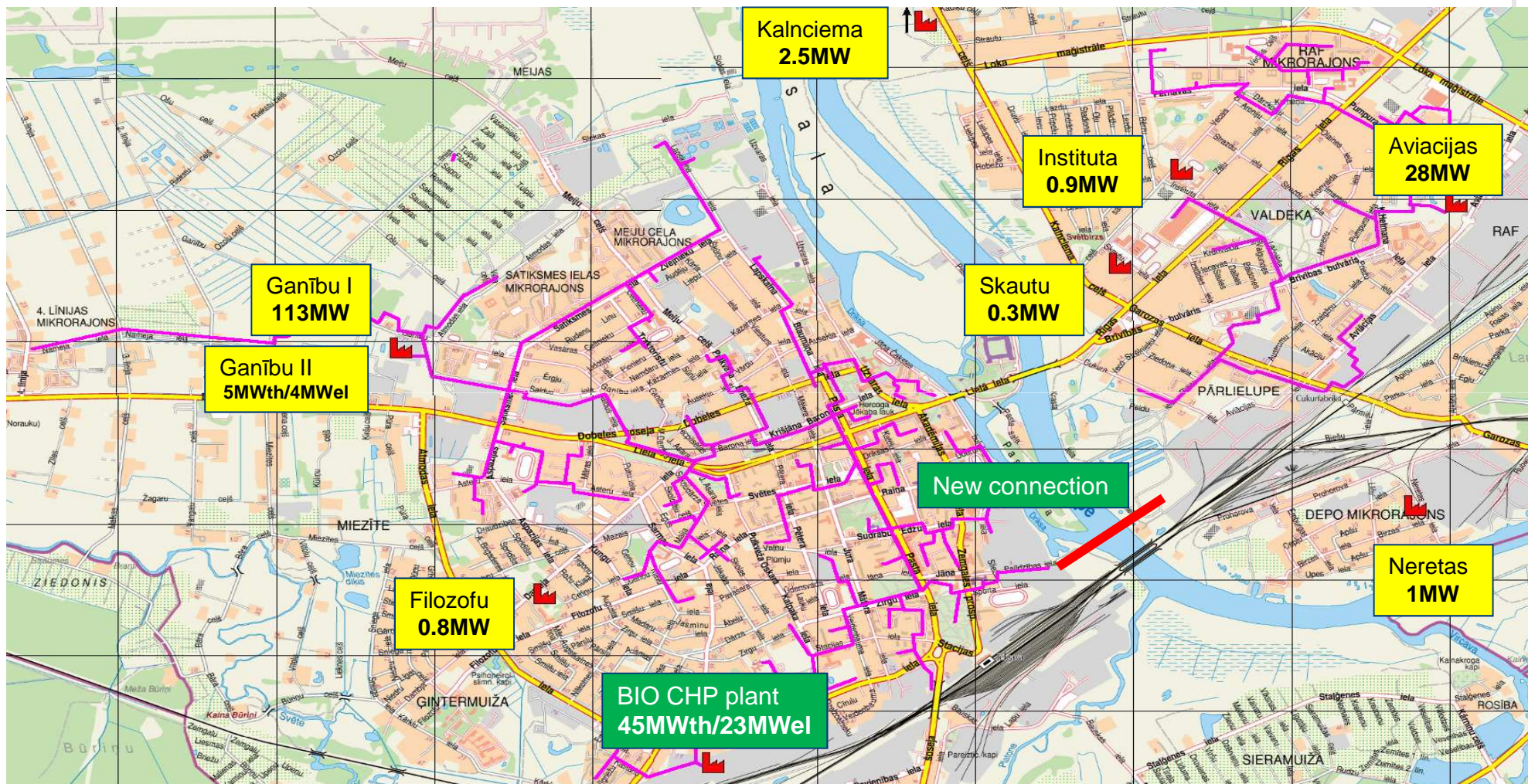
Heat Tariffs in Latvia April 2010, LVL/MWh



Heat Tariffs in Latvia September 2010, LVL/MWh

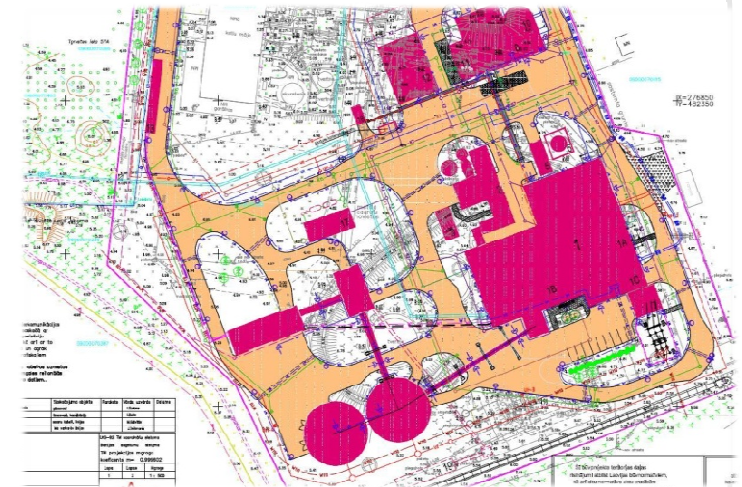


Fortum Jelgava (heat supply in perspective)

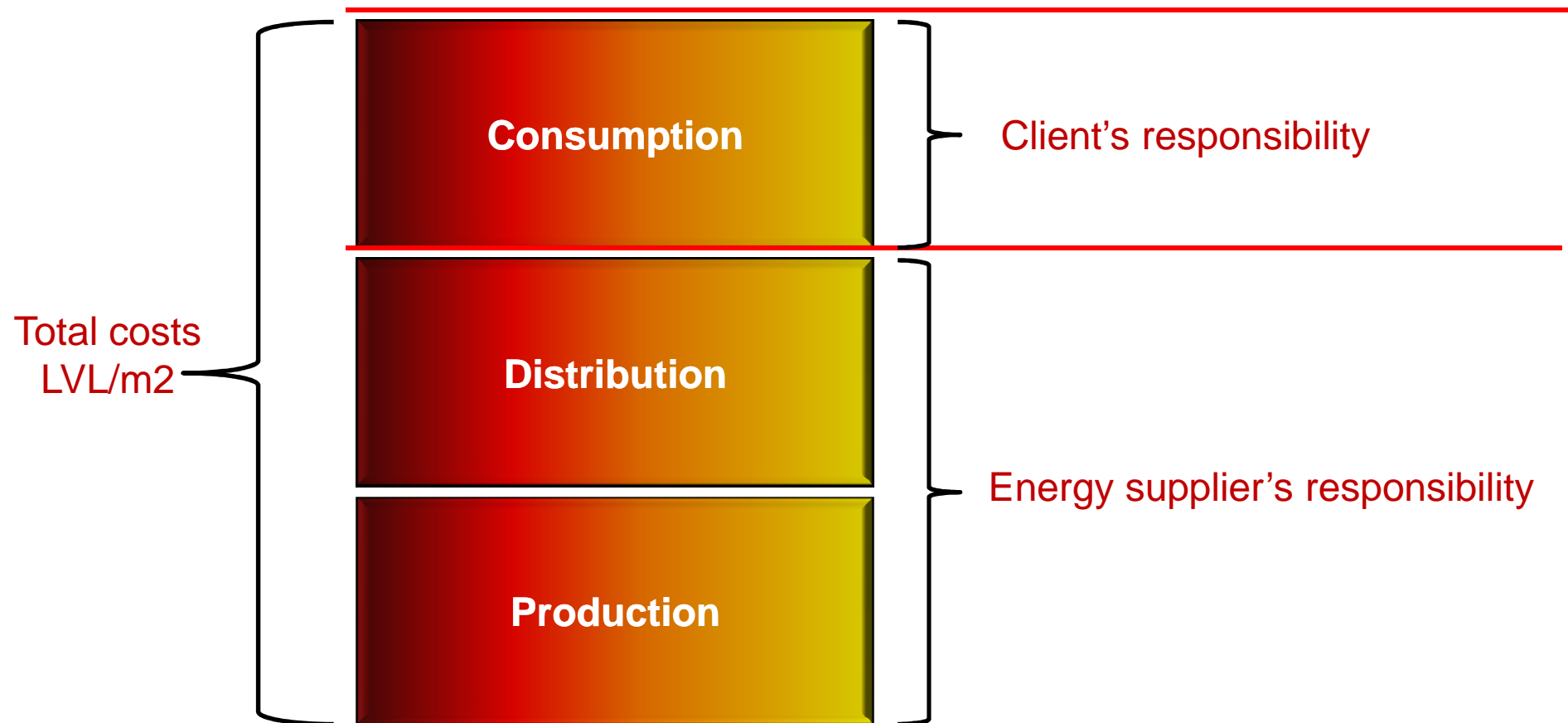


Construction of Bio Fuel CHP Plant in Jelgava

- Installed capacity – 45th / 23el MW
- Fuel: wood, straws, etc.
- Boiler technology: Bubbling Fluidized Bed Boiler
- Turbine technology: backpressure steam turbine
- Amount of heat energy produced per year – up to 230 GWh
- Planned investments up to 65 MEUR
- Finalization of the project – in Dec, 2012
- Within the scope of the project it is required to construct a connection pipeline between the two networks.



Structure of heat energy costs



Improvements in DH network

